



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/813,476	03/30/2004	Xiangyang Zhuang	CML01499M	4791
22917	7590	09/07/2006	EXAMINER	
MOTOROLA, INC. 1303 EAST ALGONQUIN ROAD IL01/3RD SCHAUMBURG, IL 60196			HOM, SHICK C	
			ART UNIT	PAPER NUMBER
			2616	

DATE MAILED: 09/07/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/813,476	<b>Applicant(s)</b> ZHUANG ET AL.	
	<b>Examiner</b> Shick C. Hom	<b>Art Unit</b> 2616	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 16 June 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6,9 and 11-18 is/are rejected.
- 7) ☒ Claim(s) 7-8, 10 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

**DETAILED ACTION**

***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 6/16/06 has been entered.

***Response to Arguments***

2. Applicant's arguments with respect to claims 1-18 have been considered but are moot in view of the new ground(s) of rejection.

***Drawings***

3. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the pilot channel circuitry including the set of GCL sequence must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Art Unit: 2616

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

#### ***Claim Objections***

4. Claim 15 is objected to because of the following informalities: in claim 15, line 4 spell out acronym "GCL,"

Art Unit: 2616

i.e. delete "GCL" and insert ---Generalized Chirp-Like (GCL)---,  
for clarity. Appropriate correction is required.

***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1-6, 9, and 11-18 are rejected under 35 U.S.C. 102(b) as being anticipated by Mody et al. (2002/0181509).

Regarding claims 1, 11, and 15:

Mody et al. disclose the method for assigning a pilot sequence to communication units within a communication system, the method comprising the steps of: assigning a first communication unit a first pilot sequence, wherein the first pilot sequence is selected from a group of pilot sequences constructed from a set of Generalized Chirp-like (GCL) sequences; and assigning a second communication unit a second pilot sequence taken from the group of pilot sequences

Art Unit: 2616

constructed from the set of GCL sequences; and utilizing the pilot sequence for at least one of the following: acquisition and tracking of timing and frequency synchronization, estimation and tracking of desired channels for subsequent demodulation and decoding, estimation and monitoring of characteristics of other channels for handoff purposes, and interference suppression (see paragraph 0007 which recite transmitting voice, data, video data frames having preamble at the beginning of the data frames in communication systems to a remote location for the purpose of synchronization as well as channel parameter estimation and paragraphs 0038-0041 which recite providing pilot/training symbols to the preamble of the frame of the sub-channels, whereby the pilot/training symbols for each sub-channel being unique to the particular sub-channel, and the pilot/training symbols being chirp-like sequences).

Regarding claims 2-4, 12-13:

Mody et al. disclose wherein the step of assigning the first communication unit the first pilot sequence comprises the step of assigning a first base unit, remote unit, or sector of a base station the first pilot sequence, and wherein the step of assigning the second communication unit the second pilot sequence comprises the step of assigning a second base unit, remote unit, or sector of a base station the second pilot

Art Unit: 2616

sequence (see paragraph 0007 which recite transmitting to remote location clearly anticipate the base unit/station and remote unit and paragraph 0037 which recite using multiple sub-channels for transmitting over different frequency whereby orthogonality can be maintained clearly anticipate the assignment of the first and second pilot sequence to the first and second remote units as in claims 2-4).

Regarding claim 5:

Mody et al. disclose wherein the step of assigning the first communication unit the first pilot sequence comprises the step of assigning a first antenna of a sector of the base station the first pilot sequence, and wherein the step of assigning the second communication unit the second pilot sequence comprises the step of assigning a second antenna of a sector of the base station the second pilot sequence (see paragraph 0052 which recite antennas for transmitting and receiving frame having the pilot symbols).

Regarding claim 6:

Mody et al. disclose performing the step of determining a length of the pilot sequences based on a number of pilot sequences needed in the communication system and a desired pilot sequence length (see paragraphs 0064-0066 which recite the symbol length being bases on  $N_T$  and determined by the designer).

Art Unit: 2616

Regarding claims 9, 14, 16:

Mody et al. disclose wherein the first and the second pilot sequences are constructed from the GCL sequences or from sequences resulting from taking a size- $N_G$  unitary transformation of the GCL sequences; and the GCL sequences are generated as

$$S_u = (a_u(0)b, a_u(1)b, \dots, a_u(N_G - 1)b),$$

where  $b$  is any complex scalar of unit amplitude and

$$a_u(k) = \exp(-j2\pi u^{(k(k+1)/2 + qk)} / N_G),$$

where,

$u=1, \dots, N_G-1$  is known as the "class" of the GCL sequence

$k=0, 1, \dots, N_G - 1$

$q$ =any integer (see the equation for the chirp sequence in paragraphs 0041-0042).

Regarding claim 17:

Mody et al. disclose wherein a peak to average power ratio (PAPR) of the pilot channel sequence is lower than a PAPR of data transmitted over the data channel circuitry (see paragraph 0043 which recite low PAPR being used to form the training sequence).

Regarding claim 18:



Art Unit: 2616

Mody et al. disclose wherein the pilot channel sequence is transmitted at a higher power than the data (see paragraph 0050 which recite the use of OFDM signal generally having a high average power ratio and must be backed off to prevent non-linear region).

***Allowable Subject Matter***

7. Claims 7-8 and 10 would be allowable if rewritten to include all of the limitations of the base claim and any intervening claims.

***Conclusion***

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Bejjani et al. disclose a receiver and method for CDMA transmission with enhanced path searcher.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shick C. Hom whose telephone number is 571-272-3173. The examiner can normally be reached on Mon-Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Seema Rao can be

Art Unit: 2616

reached on 571-272-3174. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

SH

SH

*Seema S. Rao*  
SEEMA S. RAO 9/5/06  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2600